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(54) Fibre reinforced articles

(57) A sheet or panel intended primarily for interior building work and comprising a GRG shell bonded to an essentially non-flexible and preformed sheet of expanded foamed polystyrene or other cellular-structured material having good heat-insulating properties.

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SPECIFICATION

Fibre reinforced articles

The invention relates to fibre reinforced articles and to methods of making them.

Fibre reinforcement is well known as a means of strengthening articles without adding substantially to their weight. Glass fibre reinforced plastics (GRP) shells have long been made by laminating fibrous chopped strand mat with curable plastics resins to set around a forming core from which the set shell is subsequently released. Glass fibre reinforced gypsum (GRG) panels have been made by blowing glass fibres from a feed chopper into a spray of liquid gypsum and impacting the resulting mixture against a moulding surface (UK Patent Specification No 1 360 803 of NRDC) or by impregnating monofilament continuous strand glass fibre matting with a plaster slurry under pressure against a moulding surface (UK Patent Specification No 1 520 411 of D L Gillespie) so that in each case the fibre is distributed substantially throughout the thickness of the plaster; and releasing the set composite lamina from the mould.

A paper by J F Ryder of the Building Research Station forms part of the published proceedings of an international building exhibition conference sponsored by the BRS at Olympia, London on 24th November 1971 and entitled "Prospects for Fibre Reinforced construction materials". This paper covers the construction of GRG sheets used as partitioning panels in a school for test and evaluation purposes.

These existing publications disclose and concentrate on the production of panels or sheets which are relatively thin and which seek to combine light weight with, in one case, rigidity and good fire-resistance (UK Patent Specification No 1 520 411) and in another case (again 1 520 411) non-rigid flexibility and good shock resistance.

Another known patent specification (UK Patent Specification No 1 390 360) also discloses production of GRG-reinforced sheet panels by coating a sheet material such as hardboard on one or both sides by a successive layering technique to form a composite panel of desired thickness. Here again, the teaching of this patent specification emphasises the production of relatively thin and inherently flexible sheets or panels.

In all these known disclosures, the sheets or panels rely wholly on the properties of the composite lamina for their inherent strength. And in none of them is there any discussion or suggestion that GRG technology might successfully be adapted to producing sheets or panels to replace the traditional plasterboarding used universally to face the interior walls of buildings.

UK Patent Specification No 2 162 464 (Stoneface Limited) discloses an elongate ceiling coving comprising a GRG shell bonded to and backed by a polystyrene block which is co-extensive with the shell. In an application such as ceiling coving, flexibility and flexural strength is of relatively little account. The teachings of the prior specifications reviewed above are thus not directly applicable to such a field.

The present invention, similarly, is based on the realisation that sheets or panels intended primarily for interior building work can be produced by facing a sheet of expanded foamed polystyrene or other suitable heat-insulator on one or both sides with a GRG coating preferably spray-applied by any appropriate method such as those taught in the prior specifications reviewed above.

In its broadest aspect, accordingly, the invention is embodied in a sheet or panel intended primarily for interior building work and comprising a GRG shell bonded to an essentially non-flexible and preformed sheet of exanded foamed polystyrene or other cellular-structured material having good heat-insulating properties.

Sheets or panels embodying the invention do not need "skimming" as do traditional plasterboard sheeting. Neither do they have the weight of such traditional sheeting. At the same time, whilst being light in weight, they are nowhere near as easily broken or cracked as traditional plasterboard sheeting. They can be self-coloured; embossed on their outward-facing GRG surface with any desired design; streaked to give a "marbled" effect during manufacture; and easily polished to give a "white formica" (FORMICA is a trade mark) finish.

It is known to use traditional plasterboard sheeting backed by separate expanded foamed polystyrene sheets, to insulate (for example) a bathroom against heat loss. But the plasterboard and polystyrene sheets are handled ad assembled into place as separate units. The polystyrene sheeting is, if anything, even more easily damaged than the plasterboard sheeting during such assembly operations. Sheets or panels embodying the invention avoid these disadvantages.

The prior specifications reviewed above, particularly Specification 2 162 464 (Stoneface) disclose methods of making GRG sheets and (again specifically in the case of Specification 2 161 464) outline ways of bonding GRG components to non-plaster backing blocks such as expanded foamed polystyrene.

Preferably in a sheet or panel embodying the invention, the cellular sheet is approximately 2" (approximately 5cm) in thickness and the or each GRG shell is a single-walled shell not less than approximately 3mm in thickness.

A sheet or panel having the approximate dimensions just set forth is well suited to making panels for interior building work and of appropriate size, for example of size approximating to the traditional plasterboard sizings conventionally sold to the building trade.

Preferably the cellular sheet is co-extensive with the or each shell.

Preferably also the cellular sheet and the or each shell are each of substantially constant thickness.

The reader is referred to the prior specifications for any other details he may need in order to put the invention successfully into practice.

By "good heat-insulating properties" I mean "having a thermal conductivity lower than that of the

GRG shell to which it is bonded". For example, having a thermal conductivity approximately the same as that of expanded foamed polystyrene (where the sheet to which the GRG shell is bonded is other than expanded foamed polystyrene).

CLAIMS

1. A sheet or panel intended primarily for interior building work and comprising a GRG shell bonded to an essentially non-flexible and preformed sheet of expanded foamed polystyrene or other cellular-structured material having good heat-insulating properties.

2. A sheet or panel according to Claim 1 in which the cellular sheet is approximately 2" (approximately 5cm) in thickness and the or each GRG shell is a single-walled shell not less than approximately 3mm in thickness.

3. A sheet or panel according to Claim 1 or Claim 2 in which the cellular sheet is co-extensive with the or each shell.

4. A sheet or panel according to any of the preceding Claims in which the cellular sheet and the or each shell are each of substantially constant thickness.

5. A sheet or panel substantially as described herein.

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